Amendments to the Specification

Please replace the paragraph beginning on page 4, line 20, with the following rewritten paragraph:

The electrically conductive grid is preferably made of copper or it is constituted by a diaphragm made of perforated electrical insulating material, for example ~~kapton~~ KAPTON®, which is a kind of ~~polymide~~ polyimide, while this diaphragm is fitted with the first conducting coating on the side near to the sensor and with the second conducting coating applied to its reverse side, where the first conducting coating is electrically isolated from the second conducting coating.

Please replace the paragraph beginning at page 5, line 10, with the following rewritten paragraph:

The invention will be described in detail according to the enclosed drawings, where

Fig. 1 shows the preferred embodiment of the secondary electron detector fitted with the ~~kapton~~ KAPTON® diaphragm according to the present invention, in the specimen chamber of the electron microscope[[,]] ;

Fig. 2 shows another preferred embodiment of the secondary electron detector with a copper grid, according to the present invention, also in the specimen chamber of the electron microscope[[,]] ;

Fig. 3 shows the sectional view of the ~~kapton~~ KAPTON® diaphragm used in the first exemplified embodiment of the detector according to this invention; and

Fig. 4 shows a preferred embodiment of the secondary electron detector with a metallic disk, according to the present invention, also in the specimen chamber of the electron microscope.

Please replace the paragraph beginning at page 5, line 22, with the following rewritten paragraph:

Fig. 1 shows the first exemplified embodiment of the secondary electron detector according to the present invention. The secondary electrons detector **1** consists of the sensor **2** located in the chamber **3** of the detector. The sensor **2** consists of the light guide **4** to whose

output **5** the photo-multiplier ~~(not shown)~~ **32** is connected and to whose output **6** the scintillator **7** is connected, whose surface is coated, while to the active surface or coating **8** of the scintillator **7** the high voltage source **9** is connected. To the detector chamber **3** vacuum air pump **10** is connected to create vacuum inside the detector chamber **3**. The wall **40** of the detector chamber **3** near to the scintillator **7** is enclosed by an electrically conductive grid **11** constructed from diaphragm **12**, in the given embodiment of ~~kapton~~ KAPTON®, with orifices **13** and fitted on both sides with conducting coatings **14** and **15**. The configuration of ~~kapton~~ KAPTON® diaphragm **12** is shown in detail in Fig. 3. To both conducting coatings **14**, **15** voltage sources **16**, **17** are connected. To the first conducting coating **14** near to sensor **2** the source **16** of a voltage of 250 V is connected and to the second conducting coating **15** far from sensor **2** the source **17** of a voltage of 500 V is connected. The electrically conductive grid **11** is covered outside the detector chamber **3** with hemispherical input grid **18**, which is connected to source **19** of low voltage of 80 to 150 V. Light guide **4** has its output **5** situated outside the detector chamber **3** and its passage through the wall **42** of the detector chamber **3** is vacuum tight. The detector chamber **3** is located in the specimen chamber **20** of the electron microscope. Front panel **3** of the secondary electrons detector **1** fitted with hemispherical input grid **18** is near to the specimen **21** in the specimen chamber **20**.

Please replace the following paragraph beginning at page 6, line 10 with the following rewritten paragraph:

The secondary electrons detector **1** in the first exemplified embodiment works as follows: The electron beam **22** accelerated in the electron microscope strikes the surface of specimen **21** and the impinging electrons cause the emission of the secondary electrons from the surface of specimen **21**, the energy of the emitted secondary electrons being only a few electronvolts, while the back-scattered electrons have the energy of several kiloelectronvolts. The back-scattered electrons are scattered to different directions and only a negligible number of them have the chance of passing through orifices **13** in ~~kapton~~ KAPTON® diaphragm **12**, as the electric field of the hemispherical input grid **18**, to which a potential of 80 V is applied, has itself a negligible energy by comparison with the energy of the back-scattered electrons. By contrast with this, the secondary electrons, in view of their low proper energy, are strongly attracted by the electric field of the hemispherical grid **18**. Due to the gaseous atmosphere in the electron microscope

specimen chamber **20**, the electrons collide in course of their movement with the gas molecules and thus further secondary electrons are created and thus the effect is multiplied. In the area under the hemispherical input grid **18** an electric field is produced by the 250 V voltage on the first conducting coating **14**. This electric field creates electrostatic micro lenses **30** at the holes in the hemispherical input grid **18** and it is transmitted through the holes outside the hemispherical input grid **18**. The secondary electrons reaching the surface of the hemispherical input grid **18** thus do not generally impinge on the hemispherical input grid **18**, but pass through the holes in the grid to the compartment between the hemispherical input grid **18** and ~~kapton~~ KAPTON® diaphragm **12**. They are reattracted in this space by 250 V voltage on the ~~kapton~~ KAPTON® diaphragm **12**. Nevertheless, the second conducting coating **15** has a voltage of 500 V and thus in orifices **13** analogous electrostatic lenses are created and the secondary electrons reaching the surface of ~~kapton~~ KAPTON® diaphragm **12** mostly do not strike the first conducting surface **14** but pass through orifices **13** into the detector chamber **3**. In this detector chamber **3**, they are entrained by the electric field of the coating **8** of the scintillator **7**. As it is known in the art, due to the voltage of 10 kV on the coating **8** of the scintillator **7**, the secondary electrons pass through the coating **8** and strike the scintillator **7** with an energy of approximately 10 keV. The scintillations produced by the secondary electrons striking scintillator **7** are then transmitted through the light guide **4** to the ~~photo-multiplier~~ input **34** of the photomultiplier **32**, on whose output a signal appears, whose value is in proportion to the number of secondary electrons emitted from the surface of the specimen **21**.

Please replace the paragraph beginning on page 7, line 11 with the following rewritten paragraph:

In experiments carried out with this arrangement, the ~~kapton~~ KAPTON® diaphragm **12** was used. It was made of a ~~kapton~~ KAPTON® foil 0.125 mm thick plated on both sides with aluminum and subsequently holes were drilled into it of a diameter of 0.15 mm in a square matrix of 10 x 10 holes with a spacing of 0.5 mm. The pressure in the detector chamber **3** was established by the vacuum air pump **10** to a value of less than 7 Pa. With this arrangement, a satisfactory image was attained even with a primary beam current in the order of tens of pA.

Please replace the paragraph beginning on page 7, line 18 with the following rewritten paragraph:

Fig. 2 shows the second exemplified embodiment of the secondary electron detector according to the present invention. This embodiment differs from the first exemplified embodiment by the fact that a copper grid was used in place of the electrically conductive grid **11**. In this embodiment, the system of micro lenses **30** on the electrically conductive grid **11** is omitted that was introduced by the different charges of the two coatings of the ~~kapton~~ KAPTON® diaphragm **12**, nevertheless, the electrically conductive grid **11** is located in a strong field of electric voltage of 10 kV on the coating **8** of the scintillator **7**, so that a system of micro lenses **30'** is also created on the electrically conductive grid **11**, which entrains the secondary electrons into the orifices **13** made in the electrically conductive grid **11** and further on to the scintillator **7**. In view of the technological difficulties related to the production of the ~~kapton~~ KAPTON® diaphragm **12** with the orifices **13** , where the ~~kapton~~ KAPTON® diaphragm **12** must be coated on both sides and the inner walls of the orifices **13** must retain their nonconductive surface, current ~~kapton~~ KAPTON® diaphragms **12** compared to the current copper grids have a much smaller ratio of the area of orifices **13** to the area of the grid material. Thus, due to the current technology of manufacturing the ~~kapton~~ KAPTON® diaphragms **12**, the current copper grids achieve a signal by one order higher than the ~~kapton~~ KAPTON® diaphragms **12.**

Please replace the paragraph beginning on page 8, line 28 with the following rewritten paragraph:

In experiments with the arrangements according to the present invention, a standard copper grid used as a specimen holder in the transmission electron microscopy was applied as electrically conductive grid **11**. The active surface of the grid was approx. 2 mm in diameter and it contained approximately 160 orifices of 0.1 mm in diameter. Compared with the ~~kapton~~ KAPTON® diaphragm **12** applied in the preceding embodiment, the area of the orifices was comparable, nevertheless, the orifices were concentrated on a ten times smaller area. A voltage of 400 to 500 V was applied to the grid **11**. In this arrangement, a signal approximately ten times stronger was attained than in the case in which the ~~kapton~~ KAPTON® diaphragm **12** was applied

and it appears to be the most effective state-of-the-art arrangement, with the added advantage of avoiding the technologically demanding production of the ~~kapton~~ KAPTON® diaphragms **12**.